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The Concurrent Validity and Sensitivity of Change of the German Version of the Health of the Nation Outcome Scales in a Psychiatric Inpatient Setting

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Abstract: Background: The Health of the Nation Outcome Scales (HoNOS) were developed to assess the severity of a mental illness. They are used as outcome measures in different countries, and are meanwhile translated from the original English version into many languages, among others into German (HoNOS-D). We conducted a study in order to estimate the concurrent validity and sensitivity to change using clinical parameters as ICD-10 diagnoses, as well as the Clinical Global Impression Scale (CGI), and the Association for Methodology and Documentation in Psychiatry (AMDP) psychopathology scale, a frequently used psychopathological rating system, in a representative clinical sample. Sampling and Methods: Data on the three instruments (CGI, AMDP, HoNOS-D) were collected at admission and discharge of 100 psychiatric inpatients using a representative clinical sample. Experienced clinicians completed the CGI, AMDP and HoNOS-D. Descriptive and comparative data analyses were performed. We estimated the concurrent validity by calculating correlations between the HoNOS and other scales. Secondly, we examined the differences between HoNOS scores related to diagnoses and demographic parameters. Thirdly we calculated change criteria and outcome effect size for the HoNOS. Results: Even in a small clinical sample ($n = 100$), the HoNOS-D items are highly correlated with the corresponding AMDP syndromes ($p \leq 0.003$). The HoNOS-D score is associated with the CGI score ($p \leq 0.01$). Correlations of HoNOS symptoms, behavior and impairment items with AMDP syndromes as well as differences in diagnoses were appropriate and comprehensible as regards clinical content, and change on the HoNOS total score is statistically significant ($t = 6.57$, d.f. = 89, $p \leq 0.0001$). Conclusion: This study is the first to investigate the concurrent validity of HoNOS-D concerning psychopathology using the AMDP rating system in a clinical sample of patients with mental disorders in an inpatient setting. HoNOS-D can be recommended for routinely screening outcomes in inpatient psychiatric settings. Our analysis showed that HoNOS-D covers psychopathology corresponding to the AMDP rating system. A limitation of the study is that the study sample comprised only an inpatient population; there may well be differences compared to an outpatient sample.

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The Concurrent Validity and Sensitivity of Change of the German Version of the Health of the Nation Outcome Scales in a Psychiatric Inpatient Setting

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Key Words

Outcome measures · Health of the Nation Outcome Scales · Mental disorders

Abstract

Background: The Health of the Nation Outcome Scales (HoNOS) were developed to assess the severity of a mental illness. They are used as outcome measures in different countries, and are meanwhile translated from the original English version into many languages, among others into German (HoNOS-D). We conducted a study in order to estimate the concurrent validity and sensitivity to change using clinical parameters as ICD-10 diagnoses, as well as the Clinical Global Impression Scale (CGI), and the Association for Methodology and Documentation in Psychiatry (AMDP) psychopathology scale, a frequently used psychopathological rating system, in a representative clinical sample. **Sampling and Methods:** Data on the three instruments (CGI, AMDP, HoNOS-D) were collected at admission and discharge of 100 psychiatric inpatients using a representative clinical sample. Experienced clinicians completed the CGI, AMDP and HoNOS-D. Descriptive and comparative data analyses were performed. We estimated the concurrent validity by

calculating correlations between the HoNOS and other scales. Secondly, we examined the differences between HoNOS scores related to diagnoses and demographic parameters. Thirdly we calculated change criteria and outcome effect size for the HoNOS. **Results:** Even in a small clinical sample ($n = 100$), the HoNOS-D items are highly correlated with the corresponding AMDP syndromes ($p < 0.003$). The HoNOS-D score is associated with the CGI score ($p < 0.01$). Correlations of HoNOS symptoms, behavior and impairment items with AMDP syndromes as well as differences in diagnoses were appropriate and comprehensible as regards clinical content, and change on the HoNOS total score is statistically significant ($t = 6.57$, d.f. = 89, $p < 0.0001$). **Conclusion:** This study is the first to investigate the concurrent validity of HoNOS-D concerning psychopathology using the AMDP rating system in a clinical sample of patients with mental disorders in an inpatient setting. HoNOS-D can be recommended for routinely screening outcomes in inpatient psychiatric settings. Our analysis showed that HoNOS-D covers psychopathology corresponding to the AMDP rating system. A limitation of the study is that the study sample comprised only an inpatient population; there may well be differences compared to an outpatient sample.

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Introduction

In the 1990s, the British Royal College of Psychiatrists developed the Health of the Nation Outcome Scales (HoNOS), a comprehensive, easy-to-use instrument for assessing clinical outcome and severity of mental disorders [1–5]. There are versions for children and adolescents, working-age adults, and over-65-year-olds [6–8]. Mental health outcome measurement has hitherto focused on areas like symptom severity, personal functioning, quality of life, perceived needs and recovery [9]. Numerous instruments were developed for measuring global mental health status and social functioning. The Clinical Global Impression Scale (CGI) and the HoNOS are two such instruments. They are designed to be used within clinical populations, and are meant to be completed after a clinical evaluation. Van Os et al. [10] point out that different aspects of the patients' symptom profile are related to different outcomes. They suggested that outcome is becoming influenced by distinct psychopathological dimensions independently and differentially.

The CGI is a standardized assessment tool, widely used in clinical psychopharmacology trials, as an outcome measure with known qualities and shortcomings [11–13]. The HoNOS was introduced in the 1990s as a more detailed mental health and psychosocial outcome measure. It consists of 12 items for the assessment of severity of mental illness, deals with symptoms and dysfunctions, and is designed to track change over time. Psychometric properties were found to be satisfactory for most of the items, but the authors of a review conclude that validity in psychiatric routine care warrants closer examination [14]. Firstly, we tried to replicate the findings from evaluations of the validity of HoNOS and the German version of HoNOS (HoNOS-D) [11, 15, 16] by examining its association with the CGI as an established routine outcome measure. Secondly, we tested the concurrent validity concerning psychopathology using the Association for Methodology and Documentation in Psychiatry (AMDP) rating system [17–21]. This instrument is used for standardized clinical assessment of psychopathology and is widely used in German-speaking countries. It has been developed in Europe by the Association for Methodology and Documentation in Psychiatry and allows the user to calculate psychopathological syndromes out of 140 symptoms. It corresponds to classical psychopathological concepts, and is useful not only in the measurement of change, but also in teaching and standardization of the clinical documentation [20].

Thirdly, we examined the HoNOS sensitivity of change in an inpatient sample. The aim of the present study was to examine the value of the HoNOS-D in a clinical inpatient context by analyzing the concurrent validity in relation to two established clinical scales that are frequently used in German-speaking countries. Our hypothesis was that HoNOS scores are associated with clinical global impression rated on the CGI, as well as with psychopathology measured by the AMDP rating system. As some of the HoNOS items target psychopathological symptoms similar to those rated on the AMDP rating system, we hypothesized that those items would highly correlate with the respective AMDP syndrome subscales.

Methods

Subjects

The study sample comprised 100 individuals admitted to the Psychiatric University Hospital of Zurich over a period of 10 months in 2009. Participants had to fulfill the following criteria: any psychiatric diagnosis according to ICD-10 except substance abuse and organic psychiatric disorder, and age between 18 and 65 years. Participants had to give written informed consent. Fifty-five percent of the inpatient sample was male. The mean age was 42 years (SD 12, range 19–65). The main diagnosis, i.e. the ICD-10 diagnosis that determined the current treatment regimen, was recorded [22]. The largest diagnostic groups were schizophrenic disorders (F2) with 37% followed by mood disorders (F3) with 33%, anxiety and stress disorders (F4) with 17% and personality disorders (F6) with 13%. The average duration of treatment for the patients was 30 days (SD 20, range 3–128).

Experienced clinicians completed the HoNOS-D [15], CGI [23], and the AMDP rating system [24] at admission and discharge relying on direct observation, interviews with patients, and information obtained from medical records.

Instruments

The HoNOS-D contains 12 items, each scored from 0 to 4. The severity of each problem is rated from 'no problem' to 'severe or very severe problem'. The total score, which represents overall severity, ranges between 0 and 48. It was suggested that the scale could be subdivided into 4 subscales ('behavioral problems', 'impairment', 'symptomatic problems' and 'social problems'). However, there is not really much evidence that subscale scores are reliable [14, 16, 25, 26]. Therefore, we only used the HoNOS-D main score and single items for further calculations. The CGI provides the severity of illness score for the assessment of patients' current symptom severity and it measures change over time. The CGI consists of 3 global subscales: the severity of illness subscale, the global improvement subscale and the efficacy index. The severity of illness subscale scores range from 1 ('not ill') to 7 ('extremely ill'). The global improvement subscale scores go from 1 ('very much improved') to 7 ('very much worse'). The efficacy index scores range from 0 ('marked improvement') to 4 ('unchanged or worse'). The AMDP rating scale consists of 140 items equaling psychopathological symptoms rated on a 5-point scale (absent

mild-moderate-severe-extremely severe) [11]. A number of syndromes can be composed out of up to 13 AMDP items each, i.e. paranoid-hallucinatory, depressive, psychoorganic, maniac, hostility, autonomic, apathy and obsessive-compulsive syndrome.

The HoNOS-D and CGI were completed on 100 subjects at admission, and on 90 subjects at discharge, and the AMDP rating system on 96 subjects at admission and discharge.

The study was approved by the ethics committee of the medical faculty of the University of Zurich. All patients gave written informed consent prior to study inclusion. This study was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

Statistical Analysis

The data were analyzed with SPSS 15.0 for Windows software (SPSS Inc., Chicago, 2006) [27]. Descriptive analyses were used to examine clinical and demographic characteristics, as well as the statistical properties of scales. Since distributions of raw scores on AMDP syndrome scales were highly skewed with a large proportion of subjects showing little pathology, associations of AMDP syndrome subscales and HoNOS-D items were analyzed by Spearman's rank order correlation. Due to the high number of comparisons the level of significance was adjusted to $p = 0.003$ to avoid alpha error accumulation. CGI and HoNOS-D correlations were calculated by using Pearson's r coefficients. Differences in HoNOS item and total scores between diagnostic groups, age and gender were calculated using the t test. Due to multiple testing the level of significance was adjusted to $p = 0.004$ according to Bonferroni.

Results

The analyzed data showed an association between the mean HoNOS-D total score at admission and the CGI severity index at admission ($r = 0.201$, $p = 0.045$). The HoNOS-D at discharge correlated highly with the CGI severity index at discharge ($r = 0.347$, $p = 0.001$). The correlation between the mean HoNOS difference total scores (admission total score minus discharge total score) and CGI improvement score was $r = 0.257$ and $p = 0.014$.

Mean scores on the HoNOS-D items at admission were distributed as depicted in table 1 [mean scores range from 0 (no problem) to 4 (severe problem)]. There were no missing values for individual HoNOS-D items.

Concurrent validity was tested by correlating HoNOS-D items 1–12 with AMDP syndromes. Table 2 shows that HoNOS-D items are highly correlated with the corresponding AMDP syndromes as regards clinical content. As expected, the highest coefficients (Spearman's $\rho > 0.4$) were found in correlations of HoNOS-D items with clinically corresponding AMDP syndromes: aggression/agitation and hostility/mania syndrome, cognitive dysfunction and psychoorganic syndrome, hallucinations/

Table 1. Distribution characteristics of the items of HoNOS-D (at admission, mean \pm SD; $n = 100$)

Item	Label	Mean \pm SD
1	Aggression	0.88 \pm 1.1
2	Self-harm	0.46 \pm 1.12
3	Substance use	0.80 \pm 1.48
4	Cognitive dysfunction	1.18 \pm 1.18
5	Physical disability	0.82 \pm 1.28
6	Hallucinations/delusions	1.38 \pm 1.72
7	Depression	2.69 \pm 1.16
8	Other symptoms	3.22 \pm 1.35
9	Problems with personal relationships	2.27 \pm 1.15
10	Problems with overall functioning	2.36 \pm 1.05
11	Residential problems	1.30 \pm 1.88
12	Occupational problems	2.14 \pm 1.37
1–12	HoNOS-D total sum	20.59 \pm 5.95
1–12	HoNOS-D total mean	1.72 \pm 0.50

delusions and paranoid-hallucinatory syndrome, as well as depression and depressive syndrome.

Mean HoNOS scores and change scores are shown in table 3. The presented outcome effect sizes are calculated by dividing the change score by the standard deviation of the assessment score. Change on HoNOS total score is statistically significant ($t = 6.57$, d.f. = 89, $p < 0.0001$) with a pre-post effect size of 0.92. Items 5 ($p = 0.24$), 9 ($p = 0.06$), and 11 ($p = 0.2$) showed change scores that were not significant at the $p < 0.05$ level.

Neither the HoNOS total score nor the CGI severity index differed in relation to the diagnostic groups according to ICD-10. In our sample, males ($n = 55$) had significantly higher ratings on 'overactivity, aggression' (mean = 1.09, SD = 1.19) than females (mean = 0.62, SD = 0.91; $t = 2.22$, $p = 0.028$). Females ($n = 45$) had significantly higher ratings on 'self-harm' (mean = 0.76, SD = 1.38) than males (mean = 0.22, SD = 0.78; $t = -2.32$, $p = 0.024$). There were no gender differences regarding the remaining items and the HoNOS mean total score.

Patients over 41 years (median age) had significantly higher ratings on 'physical disability' compared to younger individuals (mean = 1.17, SD = 1.43; $t = -2.64$, $p = 0.01$). They had lower scores on 'hallucinations/delusions' (mean = 1.06, SD = 1.45; $t = 1.82$, $p = 0.072$), 'problems with personal relationships' (mean = 2.02, SD = 1.23; $t = 2.11$, $p = 0.037$), 'problems with overall functioning' (mean = 2.02, SD = 1.00; $t = 3.25$, $p = 0.02$), 'occupational problems' (mean = 1.69, SD = 1.00; $t = 3.25$, $p = 0.02$) and 'total score' (mean = 19.17, SD = 6.42; $t = 2.35$, $p = 0.021$).

Table 2. Correlation matrix of HoNOS-D scale and items with AMDP syndromes (Spearman's rank order correlation; n = 96)

	AMDP	PARHAL	DEPRES	PSYORG	MANI	HOST	VEGET	APA	OBCOM
HoNOS	0.352**	0.213	0.224	0.230	0.074	0.206	0.092	0.342**	0.110
Aggression/agitation	0.137	0.318**	-0.208	0.193	0.379**	0.415**	-0.024	0.026	0.040
Self-harm	0.153	-0.052	0.238	-0.014	-0.020	-0.021	0.104	0.156	0.111
Substance use	-0.002	-0.062	0.047	-0.072	0.075	-0.093	-0.094	0.091	-0.045
Cognitive dysfunction	0.212	0.330**	-0.169	0.509**	0.095	0.203	-0.079	0.235	0.014
Physical disability	0.082	-0.119	0.200	-0.019	0.050	0.041	0.251	0.028	-0.043
Hallucinations/delusions	0.244	0.675**	-0.240	0.324**	0.046	0.096	0.015	0.149	0.145
Depression	0.256	-0.180	0.541**	-0.014	-0.298**	-0.083	0.110	0.212	0.158
Other symptoms	-0.017	-0.159	0.177	-0.077	-0.106	-0.029	0.090	-0.019	0.091
Personal relationships	0.326*	0.088	0.258	0.105	0.060	0.185	0.186	0.222	0.074
Overall functioning	0.337*	0.132	0.230	0.202	-0.051	0.218	0.180	0.371**	0.026
Residential problems	0.068	0.182	0.021	-0.027	0.068	-0.016	0.023	0.183	-0.111
Occupational problems	0.017	-0.115	0.106	0.024	-0.075	0.114	0.103	0.200	-0.012

** $p < 0.003$; * $p = 0.001$.

PARHAL = Paranoid-hallucinatory syndrome; DEPRES = depressive syndrome; PSYORG = psychoorganic syndrome; MANI = maniac syndrome; HOST = hostility syndrome; VEGET = autonomic syndrome; APA = apathy syndrome; OBCOM = obsessive-compulsive syndrome.

We analyzed the diagnostic groups ['schizophrenia' (n = 37), 'mood disorders' (n = 33), 'neurotic, stress-related and somatoform disorders' (n = 17) and 'disorders of adult personality and behavior' (n = 13)] regarding the HoNOS scores and found that patients with a schizophrenia diagnosis according to ICD-10 showed significantly higher scores for 'aggression, overactivity' ($p = 0.003$), 'cognitive dysfunction' ($p \leq 0.0001$) and 'hallucinations, delusions' ($p \leq 0.0001$). They showed lower scores on 'self-harm' ($p = 0.007$), 'physical' ($p = 0.003$) and 'depression' ($p = 0.06$).

Patients in the mood disorder group had higher scores for 'depression' ($p = 0.091$), 'physical disability' ($p = 0.047$) and lower scores for 'aggression, overactivity' ($p = 0.001$), 'cognitive dysfunction' ($p = 0.015$), and 'hallucinations, delusions' ($p < 0.0001$). Patients with a neurotic, stress-related and somatoform diagnosis showed significantly lower scores for 'cognitive dysfunction' ($p = 0.04$).

Discussion

The present paper reports findings concerning the concurrent validity of the German version of the HoNOS in relation to an established psychiatric outcome scale and a measure for psychopathological rating. In this study, we were able to show that HoNOS-D items are highly correlated with the corresponding AMDP syn-

dromes. To our knowledge, this is the first report regarding the concurrent validity tested with the AMDP rating system. Due to different psychopathological traditions and the widespread use of the instrument, we decided to employ the AMDP rating system for testing concurrent validity. Additionally, we assessed the differences in HoNOS items and total scores between diagnostic groups according to ICD-10. Correlations of HoNOS symptoms, behavior and impairment items with AMDP syndromes as well as differences in diagnoses were appropriate and comprehensible as regards clinical content. As such we suggest that the HoNOS has moderate concurrent validity in covering psychopathology and clinical status. Other authors tested concurrent validity with the Brief Psychiatric Rating Scale, the Positive and Negative Syndrome Scale and other instruments [2, 28, 29]. Basically, the HoNOS seemed to perform well; however, there are exceptions with a low correlation being found [30] between the HoNOS and the Brief Psychiatric Rating Scale. Considering that there were no missing values for any HoNOS item in this small sample it would seem to be appropriate to claim a good feasibility at least in an inpatient population, due to the good availability of information (direct observation, interviews with patients and information obtained from medical records).

According to our hypothesis and to prior findings there was a significant correlation between the CGI and HoNOS-D [11, 31].

Table 3. HoNOS and CGI change data

Item		N	Mean \pm SD	Change score	95% CI change	Paired samples t test	Outcome effect size
1	a d	90	0.89 \pm 1.07 0.57 \pm 0.91	0.32	0.08–0.57	t = 2.61, d.f. = 89 p = 0.01	0.30
2	a d	90	0.49 \pm 1.16 0.14 \pm 0.61	0.34	0.12–0.56	t = 3.11, d.f. = 89 p = 0.01	0.29
3	a d	90	0.73 \pm 1.23 0.26 \pm 0.76	0.47	0.25–0.69	t = 4.26, d.f. = 89 p < 0.0001	0.38
4	a d	90	1.19 \pm 1.13 0.91 \pm 1.05	0.28	0.06–0.49	t = 2.59, d.f. = 89 p = 0.01	0.25
5	a d	90	0.79 \pm 1.25 0.67 \pm 1.06	0.12	–0.08 to 0.33	t = 1.18, d.f. = 89 p = 0.24	0.10
6	a d	90	1.40 \pm 1.70 0.81 \pm 1.40	0.59	0.33–0.85	t = 4.52, d.f. = 89 p < 0.0001	0.35
7	a d	90	2.67 \pm 1.20 1.62 \pm 1.04	1.04	0.79–1.30	t = 8.20, d.f. = 89 p < 0.0001	0.87
8	a d	90	4.33 \pm 2.41 3.61 \pm 2.81	0.72	0.22–1.22	t = 2.88, d.f. = 89 p = 0.005	0.30
9	a d	90	2.26 \pm 1.18 1.98 \pm 1.28	0.28	–0.01 to 0.57	t = 1.88, d.f. = 89 p = 0.06	0.24
10	a d	90	2.33 \pm 1.07 1.69 \pm 1.06	0.64	0.38–0.90	t = 4.93, d.f. = 89 p < 0.0001	0.60
11	a d	90	1.36 \pm 1.93 1.06 \pm 1.49	0.30	–0.16 to 0.76	t = 1.29, d.f. = 89 p = 0.2	0.15
12	a d	90	2.17 \pm 1.35 1.62 \pm 1.41	0.54	0.26–0.83	t = 3.80, d.f. = 89 p < 0.0001	0.4
Total	a d	90	20.59 \pm 6.14 14.93 \pm 7.87	5.66	3.94–7.37	t = 6.57, d.f. = 89 p < 0.0001	0.92
CGI	a d	100	5.93 \pm 0.73 4.93 \pm 0.99	1.00	0.79–0.79	t = 9.57, d.f. = 99 p < 0.0001	1.37

a = Admission; d = discharge.

In a previous publication, the authors reported the correlation between the direct measure of CGI improvement scores and the indirect measure by comparing the admission and discharge CGI severity ratings that reflect sensitivity to change [11]. In our sample, HoNOS sensitivity to change assessed by rating patients at admission and discharge (table 3) shows limitations in comparison with the CGI. Comparable to Audin et al. [32] and Andreas et al. [16], items 7 and 10 showed medium values, and the majority of the items and the HoNOS total score proved to be moderately sensitive to change, although our sam-

ple differs from their sample with regard to 37% of the participants having a schizophrenia diagnosis. Item 11 ('residential problems') has to be understood in the context of the average duration of treatment (30 days), changes in this timeframe not being likely.

Our sample showed a higher HoNOS mean score (20.59) than other studies [2, 32]. A number of gender and age effects were found. Males had significantly higher ratings on 'overactivity, aggression' and lower ones on 'self-harm' than females. Patients over 41 years had significantly higher ratings on 'physical disability' and low-

er ratings on 'total score. HoNOS appears to display change over time adequately according to the well-established CGI improvement scale. The HoNOS covers both clinical problems (not diagnosis) and social dysfunction [28]. Therefore, it is increasingly used in psychiatric routine care. The sample of subjects used in this study was drawn from the inpatient population in the public sector and differed for example from the private inpatient population drawn by Berk et al. [11] as regards symptom severity and/or diagnosis distribution. The sample presents a higher score regarding symptom severity as determined by the HoNOS. Moreover, the largest diagnostic group in the present sample was 'schizophrenic disorder' (37%) as opposed to former investigations [11, 15, 32]. The aim of the present study was to assess the validity of the instrument in a small clinical sample in relation to two well-established outcome measures. The small sample size that was employed in the present investigation – a possi-

ble shortcoming – constitutes its strength as the results were nevertheless in line with previous findings concerning validity of the HoNOS. The current study was limited insofar as, while all clinicians received basic training in HoNOS-D completion, the level of interrater reliability was not formally established.

We can conclude, in addition to previous findings, that the HoNOS is a useful instrument to assess clinical and psychosocial status, and that it covers more details than the CGI and the AMDP, and is less elaborate than the latter.

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References

- Wing J, Curtis RH, Beevor A: Health of the Nation Outcome Scales (HoNOS). Glossary for HoNOS score sheet. *Br J Psychiatry* 1999; 174:432–434.
- Wing JK, Beevor AS, Curtis RH, Park SB, Hadden S, Burns A: Health of the Nation Outcome Scales (HoNOS). Research and development. *Br J Psychiatry* 1998;172:11–18.
- Wing JK, Beevor AS, Curtis RH: HoNOS: Health of the Nation Outcome Scales. Report on Research and Development. London, Royal College of Psychiatrists, 1996.
- Bech P, Bille J, Schütze T, Sondergaard S, Waerst S, Wiese M: Health of the Nation Outcome Scales (HoNOS): implementability, subscale structure and responsiveness in the daily psychiatric hospital routine over the first 18 months. *Nord J Psychiatry* 2003; 57:285–290.
- Bech P, Bille J, Waerst S, Wiese M, Borberg L, Treufeldt P, Kessing L: Validity of HoNOS in identifying frequently hospitalized patients with ICD-10 mental disorders. *Acta Psychiatr Scand* 2006;113:485–491.
- Burns A, Beevor A, Lelliott P, Wing J, Blakey A, Orrell M, Mulinga J, Hadden S: Health of the Nation Outcome Scales for elderly people (HoNOS 65+). Glossary for HoNOS 65+ score sheet. *Br J Psychiatry* 1999;174:435–438.
- Burns A, Beevor A, Lelliott P, Wing J, Blakey A, Orrell M, Mulinga J, Hadden S: Health of the Nation Outcome Scales for elderly people (HoNOS 65+). *Br J Psychiatry* 1999;174:424–427.
- Gowers SG, Harrington RC, Whitton A, Beevor A, Lelliott P, Jezzard R, Wing JK: Health of the Nation Outcome Scales for Children and Adolescents (HoNOSCA). Glossary for HoNOSCA score sheet. *Br J Psychiatry* 1999;174:428–431.
- Trauer T: Outcome measurement in chronic mental illness. *Int Rev Psychiatry* 2010;22: 99–113.
- van Os J, Gilvarry C, Bale R, van Horn E, Tattan T, White I, Murray R: To what extent does symptomatic improvement result in better outcome in psychotic illness? UK700 Group. *Psychol Med* 1999;29:1183–1195.
- Berk M, Ng F, Callaly T, Bernardo M, Trauer T: The validity of the CGI severity and improvement scales as measures of clinical effectiveness suitable for routine clinical use. *J Eval Clin Pract* 2008;14:979–983.
- Guy W: ECDEU Assessment Manual for Psychopharmacology – Revised. Rockville, US Department of Health, Education and Welfare, Public Health Service, 1976.
- Beneke M, Rasmus W: 'Clinical Global Impressions' (ECDEU): some critical comments. *Pharmacopsychiatry* 1992;25:171–176.
- Pirkis JE, Burgess PM, Kirk PK, Dodson S, Coombs TJ, Williamson MK: A review of the psychometric properties of the Health of the Nation Outcome Scales (HoNOS) family of measures. *Health Qual Life Outcomes* 2005; 3:76.
- Andreas S, Harfst T, Dirmaier J, Kawski S, Koch U, Schulz H: A psychometric evaluation of the German version of the Health of the Nation Outcome Scales, HoNOS-D: on the feasibility and reliability of clinician-performed measurements of severity in patients with mental disorders. *Psychopathology* 2007;40:116–125.
- Andreas S, Harfst T, Rabung S, Mestel R, Schauenburg H, Hausberg M, Kawski S, Koch U, Schulz H: The validity of the German version of the Health of the Nation Outcome Scales (HoNOS-D): a clinician-rating for the differential assessment of the severity of mental disorders. *Int J Methods Psychiatr Res* 2010;19:50–62.
- Bobon D: Foreign adaptations of the AMDP-system. *Mod Probl Pharmacopsychiatry* 1983;20:19–34.
- Bobon D, Mormont C, Doumont A, Mirel J, Bonhomme P, Ansseau M, Pellet J, Pull C, De Buck R, Gernay P, Mormont I, Lang F, Lejeune J, Bronckart C, von Frenckell R: Factor analysis of the French revision of the AMDP rating scales. Results of an international study of 388 cases. *Acta Psychiatr Belg* 1982;82:371–389.
- Bobon D, von Frenckell R, Mormont C: Interrater reliability of the French AMDP Psychopathology Scale: a new measurement in single cases. *Mod Probl Pharmacopsychiatry* 1983;20:161–173.
- Bobon D, Woggon B: The AMDP-system in clinical psychopharmacology. *Br J Psychiatry* 1986;148:467–468.

- 21 Guy W, Ban TA: The AMDP and NCDEU/BLIPS systems: similarities and differences. *Mod Probl Pharmacopsychiatry* 1983;20: 185–192.
- 22 World Health Organization: The ICD-10 Classification of Mental and Behavioural Disorders. Clinical Descriptions and Diagnostic Guidelines. Geneva, World Health Organization, 1992.
- 23 Guy W: Assessment Manual of Psychopharmacology – Revised. Rockville, US, Department of Health, 1976.
- 24 AMDP: Das AMPD-System. Manual zur Dokumentation psychiatrischer Befunde, ed 8. Göttingen, Hogrefe, 2007.
- 25 Trauer T: The subscale structure of the Health of the Nation Outcome Scales (HoNOS). *J Ment Health* 1999;8:499–509.
- 26 Lauzon S, Corbière M, Bonin JP, Bonsack C, Lesage AD, Ricard N: Validation of the French version of the Health of the Nation Outcome Scales (HoNOS-F). *Can J Psychiatry* 2001;46:841–846.
- 27 SPSS: SPSS Version for Windows. 2006.
- 28 Orrell M, Yard P, Handysides J, Schapira R: Validity and reliability of the Health of the Nation Outcome Scales in psychiatric patients in the community. *Br J Psychiatry* 1999;174:409–412.
- 29 McClelland R, Trimble P, Fox ML, Stevenson MR, Bell B: Validation of an outcome scale for use in adult psychiatric practice. *Qual Health Care* 2000;9:98–105.
- 30 Adams M, Palmer A, O'Brien JT, Crook W: Health of the Nation Outcome Scales for psychiatry: are they valid? *J Ment Health* 2000; 9:193–198.
- 31 Sharma VK, Wilkinson G, Fear S: Health of the Nation Outcome Scales: a case study in general psychiatry. *Br J Psychiatry* 1999;174: 395–398.
- 32 Audin K, Margison FR, Clark JM, Barkham M: Value of HoNOS in assessing patient change in NHS psychotherapy and psychological treatment services. *Br J Psychiatry* 2001;178:561–566.